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# Reconstructing marine and continental environments using stable isotopes of diatom-opal.

A. Shemesh

Department of Environmental Sciences, The Weizmann Institute of Science, Rehovot, 76100, Israel.

Aldo.Shemesh@weizmann.ac.il

Biogenic opal provides the opportunity to measure a large suite of stable isotopes that record, within the opal structure, environmental conditions. The mineral, SiO2*nH20 retains, through its oxygen isotopes, information about surface temperature and surface salinity. Hence, it is a useful tool to reconstruct past SST variations and identify periods of extensive melt water input in the marine environment. These melt water events are directly linked to massive iceberg discharge that are related to global climatic events. It is also used to determine local changes in the hydrological setting of continental records retrieved from lake sediments. Biogenic opal also contains organic matter that is preserved within the diatom frustules and is protected by the silica structure from diagenetic alteration. The isotopic composition of carbon is generally related to $CO_2$(aq) concentration as well as primary production, shape and size of the diatoms. Nitrogen isotopes are related to nutrient utilization. Together, carbon and nitrogen isotopes provide a tool to reconstruct nutrient cycling of the surface water.

Several down core records of oxygen isotopes from the Southern Ocean will be presented and discussed in relation to global climate change. Continental records of lake sediments from Mt. Kenya, Lapland and the Ribains Maar, France will be presented and discussed in terms of local hydrological changes that are related to regional climate change.